Table 32

MONITORED TOTAL SUSPENDED PARTICULATE MATTER LEVELS IN WAUKESHA COUNTY: 1988 AND 1991

Monitoring Site	Year			
	1988		1991	
	Annual Geometric Mean ($\mu g/m^3$)[a]	Number of Exceedence Days	Annual Geometric Mean ($\mu g/m^3$)[a]	Number of Exceedence Days
1335 Cleveland Court, Waukesha	64	9	50	1
1238 The Strand, Waukesha	60	19	49	1
1344 White Rock Avenue, Waukesha	50	4	39	0
100 Bank Street, Waukesha	49	2	37	0
W239 N53 Highway K, Sussex	46	9	35	1
W224 N5045 Eastview Drive, Sussex	44	2	34	0
W227 N5978 Avon Court, Sussex	42	6	34	2
W249 N6424 Highway J, Sussex	40	1	37	0

[a] *$\mu g/m^3$ denotes micrograms per cubic meter.*

Source: Wisconsin Department of Natural Resources and SEWRPC.

Navistar foundry installed air pollution control equipment at its facility, and the City of Waukesha agreed to increase street cleaning activity in the area. The Halquist Stone Company and the Vulcan Materials Company, operators of quarries near Sussex, have also implemented air quality improvement measures since 1987.

GEOLOGY AND PHYSIOGRAPHY

Surface Geology and Physiography

The physiographic features, or surface landforms, of Southeastern Wisconsin are shown on Map 8. Four major stages of glaciation, the last of which was the Wisconsin stage, ending approximately 10,000 years ago in the State, have largely determined the physiography, topography, and soils of the Region, including Waukesha County. The dominant physiographic and topographic feature in Waukesha County is the Kettle Moraine, an interlobate glacial deposit formed between the Green Bay and Lake Michigan lobes of the continental glacier which moved in a generally southerly direction from its origin in what is now Canada. As indicated on Map 8, the remainder of the County is covered by a variety of glacial landforms and features, including various types of moraines, drumlins, kames, outwash plains, and lake basin deposits.

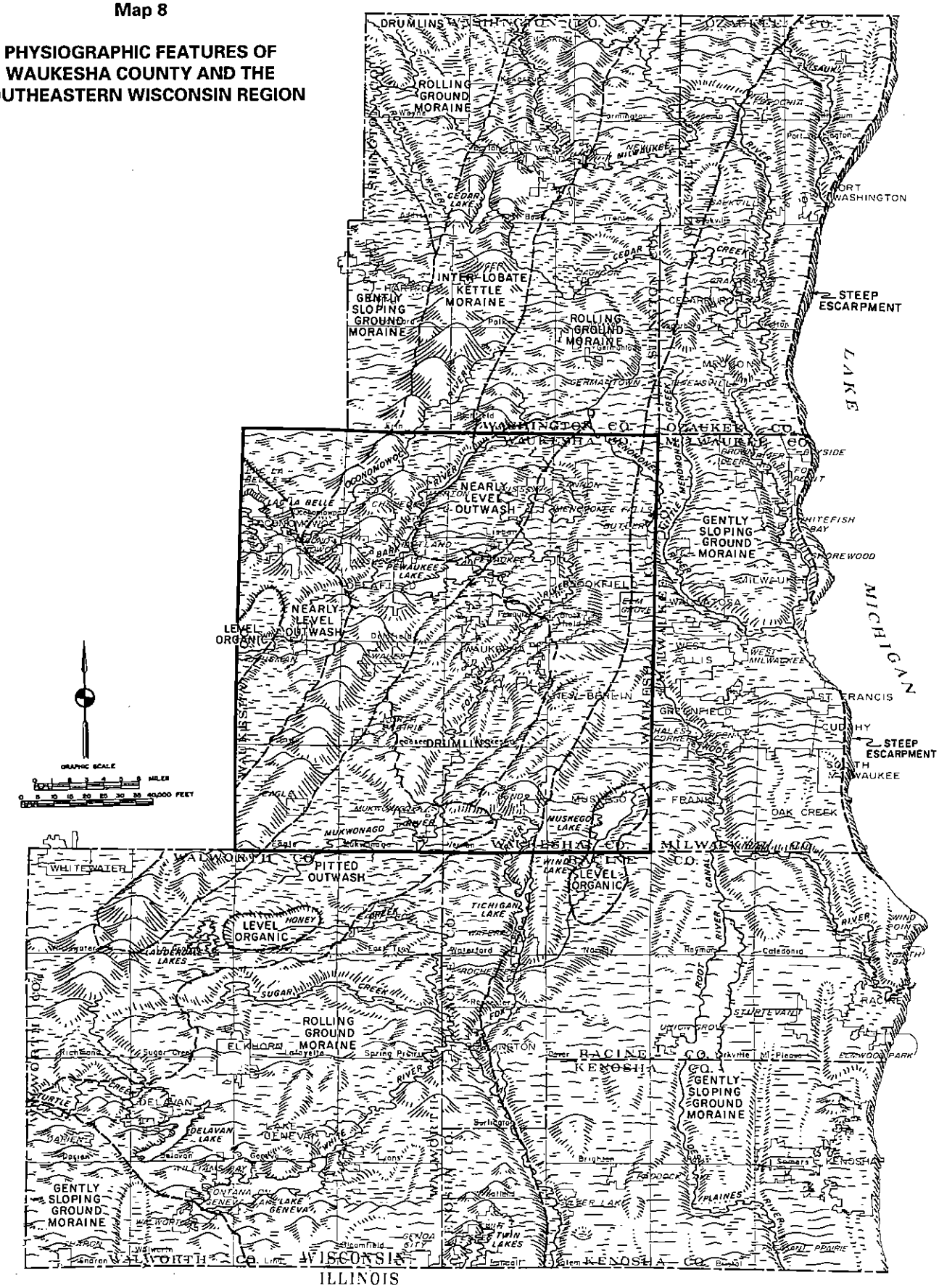
End moraines, formed by deposition at the margin of a glacier at a time when melting equaled the rate of advance, consist of unsorted debris ranging from clay to boulders. End moraine topography typically consists of a ridge with a rolling surface, often with internal drainage. Ground moraines were formed beneath glacial ice during its advance or retreat. Such moraines were deposited as a blanket of unsorted rock debris of irregular thickness, ranging from clay to boulders, and may have been buried by later glacial deposits. Ground moraines usually have moderate relief and form a gently undulating plain with no definite alignment to the undulation. In some areas, however, elongated hills of ground moraine, or drumlins, are aligned along the direction of ice movement.

Outwash plains are stratified deposits consisting of gravel, sand, silt, and clay, laid down by water from melting ice fronts. Buried outwash deposits from earlier glaciation are apparent from well drilling records, but difficult to map accurately. Lake-basin deposits are composed of materials derived from glaciers and later deposited in freshwater lakes.

The Kettle Moraine, which is oriented in a general northeast-southwest direction across western Washington, Waukesha, and Walworth Counties, is a complex system of kames, or crudely stratified conical hills; kettle holes formed by glacial ice blocks that became separated from the ice mass and melted to form depressions and small lakes as the meltwater deposited material around the ice blocks; and eskers, long, narrow ridges of drift deposited in abandoned drainageways.

Map 8

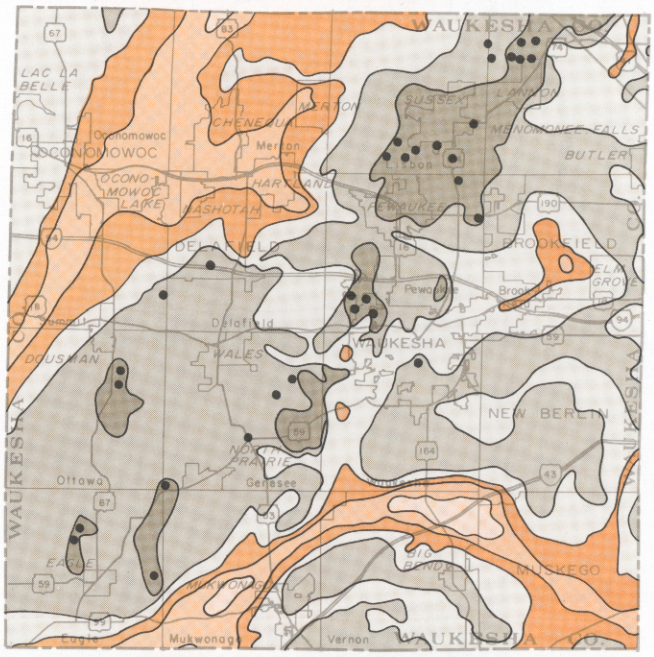
PHYSIOGRAPHIC FEATURES OF WAUKESHA COUNTY AND THE SOUTHEASTERN WISCONSIN REGION



Source: SEWRPC.

Map 9

THICKNESS OF GLACIAL DEPOSITS AND LOCATION OF BEDROCK OUTCROPS IN WAUKESHA COUNTY



LEGEND

- OUTCROPS
- 0 TO 20 FEET
- 20 TO 100 FEET
- 100 TO 200 FEET
- 200 TO 300 FEET
- 300 TO 400 FEET
- 400 TO 500 FEET
- NONE — GREATER THAN 500 FEET

GRAPHIC SCALE

0 1 2 3 4 5 6 MILES

0 10,000 20,000 30,000 40,000 FEET

Source: SEWRPC.

The combined thickness of unconsolidated glacial deposits, alluvium, and marsh deposits overlying bedrock exceeds 100 feet throughout most of the County. Thicknesses are greatest where glacial materials fill the bedrock valleys and in areas of topographic highs formed by end moraines. Map 9 shows the thickness of the unconsolidated glacial deposits overlying the bedrock in Waukesha County. As indicated on Map 9, the most substantial glacial deposits, from 300 to 500 feet thick, are located in the northwestern part of the County in the lakes area and in portions of the Towns of Mukwonago and Vernon. The thinnest glacial deposits, 20 feet thick or less, are found along an approximately six-mile-wide band traversing the County in a northeasterly direction from the Village of Eagle to the Villages of Lannon and Menomonee Falls.

Bedrock Geology

The bedrock formations underlying the unconsolidated surficial deposits of Waukesha County consist of Precambrian crystalline rocks; Cambrian sandstone; Ordovician dolomite, sandstone, and shale; and Silurian dolomite. Map 10 shows a map and cross-section of the bedrock geology of Waukesha County. The uppermost bedrock unit throughout most of the County is Silurian dolomite, primarily Niagara dolomite, underlaid by a relatively impervious layer of Maquoketa shale. In some of the pre-Pleistocene valleys in the southwestern and central portions of the County, however, the Niagara dolomite is absent and the uppermost bedrock unit is the Maquoketa shale.

Bedrock topography was shaped by preglacial and glacial erosion of the exposed bedrock. The consolidated bedrock underlying Waukesha County generally dips eastward at a rate of about 10 feet per mile. The bedrock surface ranges in elevation from about 900 feet above mean sea level, at Lapham Peak, to approximately 500 feet above mean sea level in the eastern portion of the County, as shown on Map 10. As indicated on Map 9, bedrock lies within 20 feet of the ground surface in portions of the County and a few localized areas exist where bedrock is exposed to the surface. These shallow drift areas and rock outcrops tend to occur in the County along a northeasterly-southwesterly alignment parallel to, and east of, the interlobate Kettle Moraine, reflecting the presence of a preglacial ridge.

TOPOGRAPHY

Topographic elevation in Waukesha County, shown on Map 11, ranges from approximately 730 feet above mean sea level in the extreme eastern portions of the County along tributaries of the Menomonee River in Brookfield, Elm Grove, and Menomonee Falls, to 1,233 feet at Lapham Peak in the Town of Delafield, a variation of over 500 feet. Most of the high points in the County are located along the Kettle Moraine in three distinct areas: the southern half of the Town of Delafield near Lapham Peak, the southwestern quarter of the Town of Lisbon, and between State Highways 59 and 67 in the Towns of Genesee and Ottawa.